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Typed or printed name of person signing this certificate:

Signed: Bonnie Denam - Mitchell
Bonnie HARDIN - Mitchell

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of)	Examiner: Not yet assigned
Brown, et al.)	
Serial No.: Not yet assigned)	Group Art Unit: Not yet assigned
Filed: Concurrently herewith)	
For: PROTEIN THAT ENHANCES)	Attorney Docket No.: 22884/04066
EXPRESSION OF POTASSIUM)	
CHANNELS ON CELL SURFACES)	
AND NUCLEIC ACIDS THAT)	
ENCODE THE SAME)	

Assistant Commissioner for Patents
Box Patent Application
Washington, D.C. 20231

PRELIMINARY AMENDMENT

Dear Sir:

Please preliminarily amend the present divisional application as follows:

IN THE SPECIFICATION

Page 1, line, 3, before "Background of the Invention" insert

This invention was made in part with government support under grants HL-57416, HL-55404, HL-36930, and NS-23877 from the National Institutes of Health. The government has certain rights in the invention.

Cross-Reference to Related Applications

This application is a divisional of the co-pending, commonly assigned, United States Patent Application Serial No.: 09/712,495, filed on November 14, 2000, which is a divisional of U.S. Patent Application Serial No.: 09/062,440, filed on, April 17, 1998, which issued as U.S. Patent Number 6,207,422 B1; on March 27, 2001.

Page 8, line 5, through page 9, line 11.

In another embodiment, the polynucleotide encodes for variants of KChAP protein, wherein the variants have the following sequence:

MKIKELYRRR FPRKTLGPSD LSLLSLPPGT SPVGSPXaPLA XaIPPTLLXaPG
TLLGPKREVD MHPPLPQPVH PDVTMKPLPF YEVYGELIRP TTLASTSSQR;
FEEAHFTFAL TPQQXaQQILT SREVLPGAKC DYTIQVQLRF CLCETSCPQE;
DYFPPNLFVK VNGKLCPLPG YLPPTKNGAE PKRPSRPINI TPLARLSATV;
PNTIVVNWSS EFGRNYSLSV YLVRQLTAGT LLQKLRAKGI RNPDHRSRALI;
KEKLTADPDS EVATTSLRVS LMCPLGKMRL TVPCRALTCA HLQSFDAALY;
LQMNEKKPTW TCPVCDKKAP YESLIIDGLF MEILXaSCSDC DEIQFMEDGS;
WCPMKPKKEA SEVCPPPGYG LDGLQYSPVQ XaGXaPSENKKXa VEVIDLTIES;
SSDEEDLPP TKKHCXaVTSA AIPALPGSKG XaLTSGHQPSV VLRSPAMGTLG;
XaDFLSSLPLH EYPPAFPLGA DIQGLDLFSF LQTESQHYXaP SVITSLDEQD;
XaLGHFFQXaRG TPXaHFLGPLA PTLGSSHXaSA TPAPXaPGRVS SIVAPGXaXaLR;
EGHGGPLPSG PSLTGCRSDI XaSLD, SEQ ID NO: 6;
wherein the amino acid Xa at position 37 is glycine or serine;
the amino acid Xa at position 41 is proline or serine;
the amino acid Xa at position 48 is alanine or threonine;
the amino acid Xa at position 115 is valine or leucine;
the amino acid Xa at position 335 is serine or asparagine;
the amino acid Xa at position 381 is glycine or glutamic acid;
the amino acid Xa at position 383 is aspartic acid or asparagine;

the amino acid X_a at position 384 is proline or glutamine;
the amino acid X_a at position 390 is lysine or arganine;
the amino acid X_a at position 416 is serine or proline;
the amino acid X_a at position 431 is valine or alanine;
the amino acid X_a at position 451 is glycine or serine;
the amino acid X_a at position 489 is glycine or serine;
the amino acid X_a at position 501 is alanine or threonine;
the amino acid X_a at position 508 is tyrosine or phenylalanine;
the amino acid X_a at position 513 is serine or proline;
the amino acid X_a at position 528 is cysteine or arginine
the amino acid X_a at position 535 is proline or alanine;
the amino acid X_a at position 547 is glycine or serine;
the amino acid X_a at position 548 is alanine or serine
the amino acid X_a at position 571 is isoleucine or valine.

IN THE CLAIMS

Please cancel claims 1-11, and 17-20 without prejudice or disclaimer.

Please amend the following claims:

12. (Once Amended) An isolated protein, wherein said protein is a KChAP protein or a derivative thereof, wherein said protein comprises an amino acid sequence having at least 85% identity with the amino acid sequence shown in Fig. 2, SEQ ID NO: 2 or the amino acid sequence shown in Fig. 3, SEQ ID NO: 4, or the amino acid sequence set forth in SEQ ID NO: 6.
13. (Once Amended) The isolated protein of claim 12, wherein said protein binds to Kv α subunits Kv2.1, Kv2.2, Kv1.3, and Kv4.3.

Please add the following claims:

21. (New) The isolated protein of claim 12, wherein said protein comprises a Kv α /Kv β binding domain having the amino acid sequence set forth in SEQ ID NO: 10.

22. (New) The isolated protein of claim 12, wherein said protein binds to Kv β 1.2.
23. (New) The isolated protein of claim 12, wherein said protein binds to Kv α subunits Kv2.1, Kv2.2, Kv1.3, and Kv4.3 and to the Kv β subunit Kv β 1.2.
24. (New) The isolated protein of claim 12, wherein said protein comprises an amino acid sequence selected from the group consisting of SEQ ID NO. 2, SEQ ID. NO. 4, and SEQ ID NO. 6.
25. (New) The isolated peptide of claim 16 wherein said peptide binds to Kv α subunits Kv2.1, Kv2.2, Kv1.3, and Kv4.3.
26. (New) The isolated peptide of claim 16, wherein said peptide binds to Kv β 1.2.
27. (New) The isolated peptide of claim 16, wherein said peptide binds to Kv α subunits Kv2.1, Kv2.2, Kv1.3, and to the Kv β subunit Kv β 1.2.
28. (New) The isolated peptide of claim 16, wherein said peptide comprises an amino acid sequence which is at least 95% identical to an amino acid sequence selected from the group consisting of the amino acid sequence selected from the group consisting of SEQ ID NO: 5, SEQ ID NO: 7, and SEQ ID NO: 10.
29. (New) The isolated peptide of claim 16, wherein said peptide comprises an amino acid sequence selected from the group consisting of SEQ ID NO: 5, SEQ ID NO: 7, and SEQ ID NO: 10.

REMARKS

Claims 1-20 are pending in the application. By the present amendment 1-11, and 17-20 without prejudice or disclaimer. By the present amendment, claims 12 and 13 have been amended, and new claims 21-29 have been added. Support for the amendments to claims 12 and 13 and new claims 21-25 is found on page 3, lines 18-27. Support for new claims 26-29 is found on page 3, lines 28-31 and page 4, lines 1-5. The amendments and new claims add no new matter. A document entitled "VERSION WITH MARKINGS TO SHOW CHANGES MADE" showing the additions as underlined and the deletions in brackets is attached hereto.

The specification has been amended to correct a typographical error in the position number of the last Xa in SEQ ID NO: 6. It is clear from the sequence which is depicted on pages 8 and 9 of the specification as filed that that last Xa is at position 571 in the sequence. The amendments add no new matter.

In view of the above Applicant respectfully requests entry of the present amendment.

Respectfully submitted,

Date: February 13, 2021

By: Pamela A. Docherty
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(216) 622-8416

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Specification.

Page 1, line 3,

This invention was made in part with government support under grants HL-57416, HL-55404, HL-36930, and NS-23877 from the National Institutes of Health. The government has certain rights in the invention.

Cross-Reference to Related Applications

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In another embodiment, the polynucleotide encodes for variants of KChAP protein, wherein the variants have the following sequence:

MKIKELYRRR FPRKTLGPSD LSLLSLPPGT SPVGSPXaPLA XaIPPTLLXaPG
TLLGPKREVD MHPPLPQPVH PDVTMKPLPF YEVYGELIRP TTLASTSSQR;
FEEAHFTFAL TPQQXaQQILT SREVLPGAKC DYTIQVQLRF CLCETSCPQE;
DYFPNLVFVK VNGKLCPLPG YLPPTKNGAE PKRPSRPINI TPLARLSATV;
PNTIVVNWSS EFGRNYSLSV YLVRQLTAGT LLQKLRAKGI RNPDHRSRALI;
KEKLTADPDS EVATTSLRVS LMCPLGKMRL TVPCRALTCA HLQSFDAALY;
LQMNEKKPTW TCPVCDKKAP YESLIIDGLF MEILXaSCSDC DEIQFMEDGS;
WCPMKPKKEA SEVCPPPGYG LDGLQYSPVQ XaGXaPSENKKXa VEVIDLTIES;
SSDEEDLPP TKKHCXaVTSA AIPALPGSKG XaLTSGHQPSV LVRSPAMGTLG;
XaDFLSSLPLH EYPPAFPLGA DIQGLDLFSF LQTESQHYXaP SVITSLDEQD;
XaLGHFFQXaRG TPXaHFLGPLA PTLGSSHXaSA TPAPXaPGRVS SIVAPGXaXaLR;

EGHGGPLPSG PSLTGCRSDI XaSLD, SEQ ID NO: 6;
wherein the amino acid Xa at position 37 is glycine or serine;
the amino acid Xa at position 41 is proline or serine;
the amino acid Xa at position 48 is alanine or threonine;
the amino acid Xa at position 115 is valine or leucine;
the amino acid Xa at position 335 is serine or asparagine;
the amino acid Xa at position 381 is glycine or glutamic acid;
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the amino acid Xa at position 384 isoproline or glutamine;
the amino acid Xa at position 390 is lysine or arganine;
the amino acid Xa at position 416 is serine or proline;
the amino acid Xa at position 431 is valine or alanine;
the amino acid Xa at position 451 is glycine or serine;
the amino acid Xa at position 489 is glycine or serine;
the amino acid Xa at position 501 is alanine or threonine;
the amino acid Xa at position 508 is tyrosine or phenylalanine;
the amino acid Xa at position 513 is serine or proline;
the amino acid Xa at position 528 is cysteine or arginine
the amino acid Xa at position 535 is proline or alanine;
the amino acid Xa at position 547 is glycine or serine;
the amino acid Xa at position 548 is alanine or serine
the amino acid Xa at position [570] 571 is isoleucine or valine.

IN THE CLAIMS

12. (Once Amended) An isolated [KChAP] protein, wherein said protein is a KChAP protein or a derivative thereof, wherein said protein comprises an amino acid sequence having at least 85% identity with the amino acid sequence shown in Fig. 2, SEQ ID NO: 2 or the amino acid sequence shown in Fig. 3, SEQ ID NO: 4, or the amino acid sequence set forth in SEQ ID NO: 6.

13. (Once Amended) The isolated protein of claim 12, wherein said protein [comprises an amino acid sequence having at least 85% identity with the amino acid sequence shown in Fig. 2, SEQ ID NO: 2 or the amino acid sequence shown in Fig. 3, SEQ ID NO: 4, or the amino acid sequence set forth in SEQ ID NO: 6] binds to Kv α subunits Kv2.1, Kv2.2, Kv1.3.